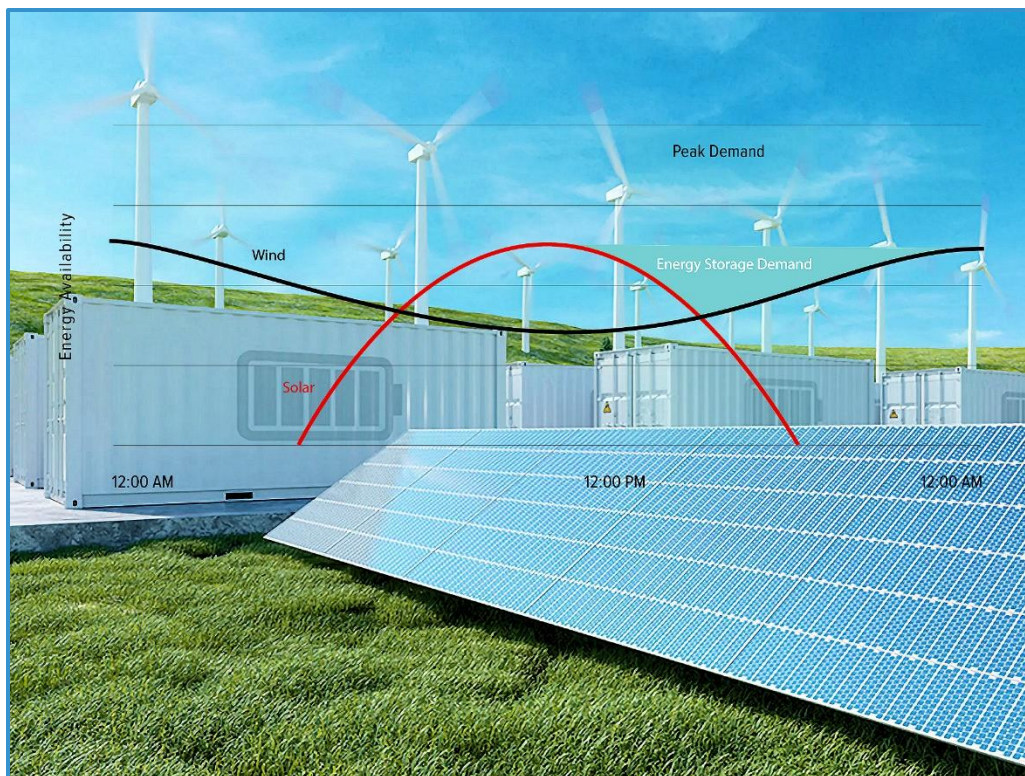


Battery Energy Storage: Optimize Power Consumption for Energy-Intensive Buildings | Building Solution Service.

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Discover the power of Battery Energy Storage Systems (BESS) in optimizing your Energy-Intensive Building projects. Learn how BESS can facilitate peak shaving, a proven strategy to flatten demand spikes and lower energy costs, while simultaneously contributing to your building's sustainability goals. Adopting this technology can propel your project towards Green, High-Performance, or Net-Zero Building certification, making it a must-have for the modern construction industry in North and South America.



Sustainable Building Solution.

In today's quest for sustainability, the construction industry is at the forefront, embracing innovative solutions to reduce carbon footprints and achieve Green Building standards. One standout solution is the implementation of Battery Energy Storage Systems (BESS) for peak shaving and optimal power consumption in Energy-Intensive Buildings.

Designed to bridge the gap between variable renewable energy supplies and the fluctuating electricity demands of Energy-Intensive Buildings, BESS serves as a very versatile tool. The technology is particularly relevant for North and South America, where demand high energy inputs are often subject to variable energy costs.

Peak Shaving.

A Game-Changer for Energy Costs and Carbon Footprint. Peak shaving is the act of eliminating spikes in energy demand by utilizing stored energy, effectively flattening the demand curve. This is where BESS comes into play. The systems can store energy when demand is low and release it during peak periods, reducing the strain on the electrical grid and, consequently, lowering energy bills.

Technical Advantages of Implementing BESS.

- High Energy Density: Batteries can store significant amounts of energy relative to their size.
- Geographic Flexibility: Lack of geographic restrictions allows for versatile deployment.
- Low Maintenance: Minimal upkeep needed, reducing long-term costs.
- Noise-Free Operation: Ideal for urban settings where noise pollution is a concern.

Sustainability Impact.

By enabling efficient use of renewable energy, BESS aids in reducing the building's carbon footprint. This capability makes it an invaluable asset for building projects aiming for Green, High-Performance, or Net-Zero building certification. Moreover, co-locating these storage systems within your

building projects improves power quality, offers backup power solutions, and can delay costly infrastructure upgrades.

What is Self-Consumption Optimization?

Self-Consumption Optimization refers to the strategic use of on-site renewable energy sources, such as photovoltaic (PV) solar installations or wind turbines, to meet the energy demands of a building. In the context of Energy-Intensive Buildings, self-consumption optimization becomes especially critical given the high energy requirements these structures typically have. Battery Energy Storage Systems (BESS) play a crucial role in this optimization strategy by storing excess energy generated from these renewable sources for later use.

Reducing Operational Energy Costs.

Energy-Intensive Buildings often experience high energy demands at times when their renewable energy installations are not generating enough electricity. Buying electricity from the grid during these high-demand periods can be expensive, costing at least 20 cents per kilowatt-hour (kWh). BESS enables these buildings to draw upon stored energy during peak demand, thereby reducing the need to buy costly energy from the grid. This significantly mitigates operational expenses and makes buildings less susceptible to rising energy costs.

Lowering Initial Investment.

When Energy-Intensive Buildings produce their own electricity, they may need to expand the grid transmission point to feed in this electricity. This upgrade can be a substantial cost, sometimes reaching up to hundreds of thousands of dollars. A Battery Energy Storage System allows buildings to store excess energy, eliminating the need for this costly grid upgrade. This not only saves on the initial investment but also offers long-term financial benefits by avoiding ongoing costs related to grid connection.

What is Peak Shaving?

Peak shaving, also known as load shedding, is a strategic approach to manage and reduce electricity costs by eliminating spikes in energy demand.

It involves rapidly decreasing power consumption during periods of high demand, either by temporarily switching off non-essential equipment or, more effectively, by employing Battery Energy Storage Systems (BESS). The primary objective is to minimize short-term surges in electricity usage, thereby reducing the overall costs associated with electricity consumption.

For Energy-Intensive Buildings, peak shaving is especially crucial because these facilities are often subject to higher peak loads compared to regular buildings. Electricity bills for such buildings are typically made up of two key components: consumption charges, measured in kilowatt-hours (kWh), and demand charges, measured in kilowatts (kW). In many regions, demand charges can account for anywhere from 30% to 70% of the total electricity bill.

This is where Battery Energy Storage Systems come into play. BESS enables the storage of excess energy generated during off-peak hours for use during peak demand periods. Through intelligent software that dynamically balances supply and demand, these systems can release stored energy precisely when it's needed, mitigating the need to draw costly power from the grid during high-demand periods. By leveling out the demand, BESS helps to avoid higher electricity tariffs and cuts operational costs significantly.

Moreover, achieving business goals and objectives often means that slowing down or shutting off operations to save on energy is not a viable option. In such scenarios, Battery Energy Storage Systems offer a seamless solution. They allow businesses to continue running at full capacity even during peak demand periods, thus ensuring that productivity and operational objectives are not compromised.

In summary, peak shaving through Battery Energy Storage Systems is an indispensable strategy for Energy-Intensive Buildings. It not only significantly reduces operational energy costs but also enables businesses to maintain uninterrupted operations, thereby fulfilling their productivity goals and objectives.

Smart Battery Energy Storage Systems.

In the dynamic world of sustainable building solutions, the technological prowess of a system often lies in the subtle nuances of its operational intelligence. Such is the case with ConstruAir's Battery Energy Storage Systems (BESS). While the hardware's power capacity and density are fundamental, it is the software's intellectual prowess that sets it apart, truly optimizing the operation to meet demand variations swiftly and effectively.

Intelligent Control Software.

The heart and brain of ConstruAir's BESS are its sophisticated software systems. Two primary types of software govern its operation:

- Energy Management System: This is the maestro that coordinates intermittency between the grid, renewable energy sources like PV solar installations or wind turbines, and the battery. Its role is to ensure that charging and discharging processes occur precisely at the right times, reacting adeptly to fluctuating demands.
- Battery Control System: This system is dedicated to maintaining power quality, ensuring frequency regulation, and overseeing the battery's safe operation throughout its lifecycle.

ConstruAir Battery Control System.

A distinctive offering from ConstruAir, this Battery Control System is not just any control software, it represents a significant leap in BESS technology. With features that manage charging and discharging based on the state-of-charge and state-of-health of the battery, this system is finely tuned for the utmost longevity of cell life. At the same time, it incorporates micro-protection mechanisms, enhancing safety and ensuring uninterrupted operation.

Moreover, this advanced control software possesses a depth of control that surpasses current industry standards. It guarantees the continuity of the Energy Storage System even if specific cells experience faults, preventing costly system shutdowns and extensive maintenance.

Repurposing Second-life Electric Vehicle Batteries.

One of ConstruAir's masterstrokes in sustainability is the integration of second-life electric vehicle batteries. Batteries from electric vehicles typically reach their end of life within 8-12 years, but they can still serve a valuable purpose. ConstruAir's innovative process repurposes these batteries in a way that's emission-free, giving them a new lease of life within their Energy Storage System. This not only underscores an impeccable commitment to sustainability but also provides a cost-effective and safe solution to the mounting challenge posed by the deluge of end-of-life electric vehicle batteries.

In summary, ConstruAir's smart battery systems offer an unparalleled combination of efficiency, reliability, and sustainability. Its proprietary digital tools render it a linchpin in sustainable building solutions, especially for projects aiming to achieve Green, High-Performance, or Net-Zero building status. With ConstruAir, you don't just get an energy storage system; you get a highly intelligent, adaptive, and sustainable solution that optimizes every kilowatt of energy, saving you money while protecting the planet.

Benefits of Battery Energy Storage Systems for Sustainable, Energy-Intensive Buildings.

➤ Self-Consumption Optimization:

- Efficiently harnesses energy from on-site renewable installations like PV solar panels and wind turbines.
- Reduces dependency on utility grid and the associated high costs during peak demand times.

➤ Peak Shaving:

- Effectively manages and reduces power consumption during peak demand intervals.
- Helps avoid expensive demand charges on the electrical grid.
- Ensures business productivity is maintained without compromising on energy costs.

- Cut Grid Connection Costs:
 - Avoids the expensive upgrade costs, which could reach up to hundreds of thousands of dollars, when expanding grid transmission points.
- Intelligent Control and Optimization:
 - Advanced Energy Management System ensures optimal charging and discharging times, adapting to fluctuating demands.
 - Proprietary Battery Control System offers micro-protection mechanisms and maximizes battery cell life.
- Enhanced Safety and Reliability:
 - Intelligent software monitors the state-of-health and state-of-charge of the battery, ensuring safe and uninterrupted operation.
 - The system's ability to continue operating even when certain cells encounter faults offers increased reliability.
- Adaptability and Modularity:
 - Designed for various applications, from commercial, industrial, and utility settings.
- Sustainable Repurposing:
 - Uses an innovative and emission-free process to repurpose end-of-life electric vehicle batteries, addressing both cost and environmental challenges.
- Cost Savings:
 - Draws less energy from the utility grid, making buildings less susceptible to rising energy costs.
 - Offers potential cost savings from avoiding grid upgrade fees.
 - Employs second-life electric vehicle batteries, presenting a cost-effective energy storage solution.
- Environmental Benefits:
 - Reduces the carbon footprint of buildings, aligning with Green, High-Performance, or Net-Zero building goals.
 - Offers a sustainable solution to the challenge of disposing end-of-life electric vehicle batteries.

- Independence from Utility Providers:
 - Reduces dependency on electricity providers and shields buildings from fluctuating energy prices.
- Seamless Integration with Renewables:
 - Offers the flexibility to work in tandem with renewable energy sources, ensuring a steady energy supply even during non-productive intervals of renewables.

In essence, Battery Energy Storage Systems offer energy-intensive buildings a multifaceted, sustainable solution that not only optimizes energy consumption and costs but also aligns with environmental and sustainability goals.